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ABSTRACT

Currently being developed by the State Library of Queensland, Australia, ORACLE (On-Line Retrieval of Acquisitions, Cataloguing, and Circulation Details for Library Enquiries) is a computerized library system designed to provide rapid processing of library materials in a multi-user environment. It is based on the Australian MARC format and fully integrates the three sub-systems of acquisitions, cataloging, and circulation. The system has automated authority control, and the authority files are available online for editing and consultation; online searching is possible by name, title, series, subject, ISBN, ISSN, and LCN. Libraries using the system can share records and adjust these to suit local requirements, and consult the union catalog online. Written in COBOL, ORACLE operates on a Control Data CYBER 72-16 computer and is scheduled for completion by June 1980. (Author/JD)

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INTRODUCING ORACLE

LIBRARY PROCESSING IN A MULTI–USER ENVIRONMENT

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IR 007 941

STATE GOVERNMENT INSURANCE OFFICE
(QUEENSLAND)

LIBRARY BOARD OF QUEENSLAND

BRISBANE, 1979.

FOREWORD

This booklet describes the ORACLE library processing system currently being developed by the State Library of Queensland in conjunction with the State Government Insurance Office (Queensland) [S.G.I.O.].

The project has already attracted considerable interest, and we believe that it represents a significant advance in library automation within Australia. The design philosophy has been to keep the system as flexible as possible (within the limits of the funds available), and to create on on-line multi-user facility in which all sub-systems are fully integrated. Progress to date has been very encouraging.

Anyone needing further information on the ORACLE system is invited to contact the Systems Co-Ordinator (Mr. S. Bastow), at the State Library of Queensland, William Street, Brisbane, Australia. 4000. (Telephone: (07) 221 8400).

S.L.Ryan,
State Librarian.

INTRODUCING ORACLE

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WHAT IS THE ORACLE SYSTEM?

ORACLE (On-LineRetrieval of Acquisitions, Cataloguing and Circulation Details for Library Enquiries) is an advanced computerised library system designed to provide rapid processing of library materials in a multi-user environment.

As indicated in the acronym, the ORACLE system will cover the three traditional functions of acquisitions, cataloguing and circulation, and it is intended that a later phase will add a serials' processing module. All three sub-systems are integrated. The system accepts bibliographic data in the Australian MARC communications format (2nd. ed., 1975), and all internal processing of this data employs Australian MARC fields and content designators.

WHAT ARE THE BENEFITS OF USING THE ORACLE SYSTEM?

On-Line Operation

With the on-line system, processing operations are fast, accurate and final. The frustrations and inefficiencies of batch-system turn-around times are avoided, resulting in a smooth and rapid work-flow through each department.

The ORACLE on-line system is supported by batch operations, and where these generate printed output the on-line user enjoys the advantage of an in-house printer directly linked to the computer. Print-out is generated where it is wanted and when it is wanted.

The on-line system also means that the ORACLE files are as close as the nearest terminal and available for instant consultation or adjustment.

Multi-User Capability

The sharing of library resources becomes a reality for users of the ORACLE system. Once a bibliographic record has been added to the computer file, it is immediately available to all users. Costly re-input and duplicated storage are avoided; the one record serves all libraries and can be modified to suit local needs without affecting the records of other users.

The construction and maintenance of complex authority file structures is a significant cost factor in any cataloguing department's budget and this task also is shared amongst users, with considerable assistance being provided by the system's authority control module.

Simplicity

ORACLE is easy to use; codes are minimal and the system responds in English.

An On-Line Union Catalogue

The multi-user capability of the ORACLE system brings with it the benefits of an on-line union catalogue. The simple instruction "FIND ALL" provides a display of all participating libraries which hold the title, and for serial items, full holdings information as well.

On-Line Searching

Whether the approach is made by name, title, subject, series or book number the system will rapidly locate the item if it is held on file. An erroneous or incomplete citation is no obstacle; all ORACLE requires is that the first three letters of the first word should be correct.

Automated Control Over Authorities

The ORACLE system provides computer control over the form and reference structures of all authority headings used in the bibliographic base. Since the form chosen is controlled by a single entry in the authority file, one transaction is all that is required in order to change every occurrence of the heading throughout the entire data base, as well as any sub-divisions which may be in use. All associated cross-references are automatically updated at the same time.

In addition to controlling the authorities, this module also takes over the laborious cross-checking required during the creation of cross-reference structures.

Integrated Sub-Systems

Integration of the various sub-systems reduces user input to a minimum, with resultant cost savings.

The basic unit of any library processing function is the bibliographic record, and integrated processing means that only one such record is required for each title. This single record can satisfy the needs of any number of libraries with any number of copies, and can be used in acquisitions, cataloguing and circulation routines.

Integration also means that all ORACLE functions are available at every terminal. Library staff can easily move between any of the sub-systems in order to obtain the information they require.

Data Security

Comprehensive data security procedures are in operation at all times in the ORACLE system.

WHAT IS THE SYSTEM'S CURRENT STATUS?

The present development schedule covers the three sub-systems of acquisitions, cataloguing and circulation based on the Australian MARC Specification [Books], 2nd ed., 1975.

Enhancements are proposed to enable the system to process the Australian MARC Specification [Books], 3rd. ed. (to co-incide with the distribution of records in this format from July 1st, 1980), and to process the various non-book formats as these are made available by the National Library of Australia.

Most of the Cataloguing Sub-system is now in use (June 1979), and final programs are under test. Production of microfiche catalogues is scheduled for October 1979 and systems design of this module is well advanced.

Programs are now being written for the Circulation Sub-system and the implementation date is scheduled for August 1979. Detailed systems design of the Acquisitions Sub-system will commence in the near future, and the total system should be in operation in February 1980.

PART 2

THE CATALOGUING SUB-SYSTEM

1. Overview
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5. Authority Files
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1. OVERVIEW

ORACLE provides each participating library with fast and efficient on-line cataloguing facilities, together with the added benefit of automated authority control. Each library has on-line access to its own catalgoue as well as to the entire ORACLE data base.

The system is fully integrated, and a single bibliographic record serves the needs of all users holding the title and all processing functions. Users may make local alterations to a shared record without affecting the records of other libraries, and the record will appear in this local form both on-line and in their microfiche catalgoues.

The Cataloguing Sub-system accepts both local and centralised cataloguing data (and provides facilities to order the latter) as well as enabling users to copy records already on file. All local cataloguing data is entered on-line, and the user can choose either to have this input verified immediately, or subsequently as a batch process. Once cataloguing is completed, spine-labels and machine-readable circulation labels are automatically produced.

The computerised authority file controls the forms of all headings in the bibliographic base, as well as all associated variant headings, notes and cross-references.

The system is multi-user, with users sharing bibliographic records, yet able to alter these to suit local requirements (in non-authority/non-search key areas) without affecting the records of other users. Thus the system also provides an on-line union catalogue.

2. STANDARDS FOR BIBLIOGRAPHIC DATA

ORACLE has been designed to process data which uses the fields and content designators of the Australian MARC format (AusMARC). With a few important exceptions, the system places no limitations upon the extent or brevity of a catalogue entry, but control is exercised by the group of libraries using the system.

All material is catalogued in accordance with the latest editions (including updates) of the following:

(a) Library of Congress Subject Headings (with the exception that the sub-division 'juvenile literature' will generally not be used)

(b) Dewey Decimal Classification

(c) Anglo American Cataloguing Rules (North American Text) – (with minor modifications as agreed upon by the Working Group to Establish Cataloguing Standards for Automation in Queensland Libraries).

All fiction for the Library Board's Public Libraries Service, (and some own-coding form the Public Libraries Service retrospective operation), will have fields missing, and this is indicated by the letter 'H' in the cataloguing source code (Tag 008 [39]).

Data from the Australian MARC Record Service (AMRS) will be to the standards of the cataloguing source from which it was derived.

All content designators must conform to the latest edition of the Australian MARC Specification for the format involved. The following is taken from the monograph specification, 2nd., 1975:

2.1 Data Fields Required

The following data is to be input if readily available at the time the item is catalogued; (the * items must always be input).

TAG		DESCRIPTION
001		ISBN
*008	*0–5	date entered on file
	* 6	type of publication date code
	7–10	date 1
	11–14	date 2
	15–17	country of publication code
	18–21	illustrations code
	22 (j)	juvenile code
	23	form of reproduction
	24–27 (c–h)	form of contents code
	28	publisher code
	*35–37	language code
	38 (p,s)	periodical code
	* 39	cataloguing source code
010		LCN
021		alternative ISBN
041		languages
*082		DC number
100–111		main entry headings
240 (First Indicator 1, 3 only)		uniform titles
243		collective titles
*245		title
250		edition
260 *(date is always present)		imprint
300 *(pagination and size always present)		collation
400–490		series statements
500–513		notes
600–651		subject added entries/headings
700–745		added entries
800–840		series added entries

2.2 **Data Fields Not Required**

TAG		DESCRIPTION
008	22 (p,s)	primary, secondary texts code
	24–27 (a,b, i–k)	form of contents codes
	29–34	conference, fetschrift, index, main entry, literary text, biography
	38 (l, m, b)	monograph code
017		correction message
018		amendment message
042		search code
043		geographic area code
050		LC number
080		UDC number
083		DC feature
350		price
518		change of control number note
521		for children note
581		availability note
690–692		PRECIS, SIN, RIN
790		tracing data
900–945		references

2.3 **Data Fields Deleted from AMRS Records**

TAG	DESCRIPTION
017	correction message
018	amendment message
690–692	PRECIS, SIN, RIN
All non-AusMARC tags	

2.4 Character Set

ORACLE utilises the Standard Set and Non-Standard Set 1 of the 6-bit coding on pages 10, 11 of the Australian MARC Specification, 2nd ed. 1975. Alternative symbols are used for the(£) sign and several alpha characters from the L.C. MARC non-standard set 2.

3. VALIDATION OF BIBLIOGRAPHIC DATA

All data input from any source is validated against the relevant AusMARC specification. If this input is made using the UCAT Screen (see Section 6.2), the system will not accept the data until it meets validation requirements within the tag. Where a tag dictates the presence of another e.g. 511/021, this will be drawn to the cataloguer's attention. For AMRS records and batched own-coding, validation errors will be listed on the system-generated worksheets. If the record is viewed on-line using the DUMP Screen (see Section 6.1), the invalid tags will be coded (I); the error will be specified on the UCAT Screen and can be corrected using that screen.

All changes to authorities, and new variant headings added (Authorities Update) are also validated against the AusMARC specification.

If authority field data e.g. an author's name, is known to be on file, it can be input to the OWNC or UCAT screens without sub-field coding; this will be supplied by the authority file.

4. CALL NUMBERS AND HOLDINGS STATEMENTS

These are added to the catalogue record as a holdings tag, with the following specification:

Tag HLD

First Indicator 0

Second Indicator 0

Sub-Field Codes

a Collection code (10 characters max.)

b Shelf-List number (minus collection code) (35 characters max.)

d Volume description (20 characters max.)

g Additional copies, parts or volumes (20 characters max.)

Special notation is required as follows in sub-fields d and g:

V Volume

P Part

C Number of copies

/ Separator

– Range

, Intellectual Description

The comma is used to indicate a bound volume e.g. V1–3, P1–6 will generate a single set of book labels and one circulation record. Sub-field 'd' is a synopsis of the holdings at this shelf-list number and is used to create screen and fiche displays. Sub-field 'g' is used to add further copies, parts or volumes.

Within sub-field 'b', the symbol $ may be used if a new label line is required,e.g.

HLD 00 00 \aNF\b954.09$HAW\dV1–3/P1–6/C2
\dV4,5/C1

The facility to assign sequence numbers to class numbers can be provided if required (subject to funds being supplied for software development).

The holdings tag is repeatable.

5. AUTHORITY FILES

Each bibliographic record in the ORACLE base is linked to a computer file of the authorised forms of the headings, (names, subjects, series or uniform titles) which appear in the record. This file also contains any relevant notes, cross-references and variant headings, and these will be automatically retrieved during on-line searches and production of microfiche catalogues.

Automated control of authorities provide:

more accurate cataloguing -- a heading, e.g. BARNES, John Thomas, appears only once on the authority file, no matter how many records may use it, or in which manner (author or subject). Any incoming heading which does not match this file is sent to the cataloguers for appraisal.

more up-to-date cataloguing – because each heading appears only once, a single transaction is all that is needed to change the heading in every record in which it is used. This transaction will also automatically alter all sub-divisions of the heading wherever they are used. Thus headings can be easily altered to conform with current usage.

faster cataloguing – the system will check to see if the heading used on an incoming record is on file, and will advise only if it is not. Variant headings will be replaced automatically unless there is more than one alternative, in which case these will be advised so that a decision can be made.

a true on-line union catalogue – as a single authority file is controlling the entire ORACLE base, a search for an item by any authority heading used will locate the record, regardless of which participating libraries may hold it.

In a network environment, such benefits obviously will impose responsibilities. Any participant has access to, and can alter, the authority records of any other library. Any participant may add or delete authorities. This we believe provides an unprecedented opportunity for professional trust and inter-library co-operation. An Editorial Board will be established to set the standards which are to be met and to arbitrate on cases in which the Standards do not provide uniquivocal directions. Each participating library will be represented on this Board.

The authority file is available for on-line interrogation, and all maintenance to the file is carried out at a VDU terminal. The system automatically compares with this file any headings that are input on-line

(during cataloguing or authority maintenance), and advises the cataloguer if any are unacceptable, and why.

6. THE ON-LINE SCREENS

At any terminal it is possible to consult all files, and to input, edit and receive information.

The system displays on the terminal, in response to specific commands, a range of specially formatted "screens". These are designed either to display or receive data and are the basic tools of the on-line system. A cataloguer has a choice of eleven (11) screens:

6.1 Interrogation Screens

These provide information, but cannot accept any changes or additions to the date displayed:

(i) **Keys Screen (authorities)**

Shows those authority headings which matched the search-key input.

(ii) **Keys Screen (bibliographic)**

Shows those authority headings or other search terms which matched the search-key input.

(iii) **Citation Screen (bibliographic) (CIT)**

Shows those catalogue records which uniquely matched either the search-key input or a particular authority heading e.g. all the books by a particular author.

(iv) **Dump**

Shows a specific bibliographic record complete with AusMARC content designators.

(v) **Full Bibliographic Screen (FULL)**

The equivalent to the main entry of the card catalogue. If this screen was displayed in response to a 'FIND–ALL" command, the screen will also list the libraries which hold the title.

(vi) **Full Authority Screen (FULL)**

Shows the notes and linkages associated with a specified authority heading, as well as the date the heading was created, the date the latest transaction was applied and the user responsible.

6.2 Working Screens

(i) **AMRS**

Accepts (without verification) AMRS order for subsequent batch processing.

(ii) **Owncode (OWNC)**

Accepts (without verification) original cataloguing for subsequent batch processing.

(iii) **Catalogue Update (UCAT)**

Accepts additions, changes and deletions (subject to validation) and immediately alters the bibliographic files (real-time response). Search-key files are altered in a subsequent batch process. Using this screen, a cataloguer can change any non-authority tag and any authority

tag not yet linked to the authority file. Any tag may be added or deleted using this screen, and thus entrie records can be created (real-time own-coding). There are some restrictions to deletions, viz the system will not permit the last 008,245 or holdings tag to be deleted and will require a password before an authority tag can be deleted. Any change or addition to authority tags is checked against the authority file and rejected/accepted/altered as appropriate. All input is validated against the appropriate AusMARC specification. Authority headings known to be on file can be input without punctuation or sub-field coding.

(iv) **Authorities Update (UPAT)**

Accepts, (subject to validation), changes to headings and the addition and deletion of variant headings. Accepts cataloguer's notes, general notes and general explanatory references and accepts and creates all types of authority linkages (after checking they are applicable to the file). Accepts deletion and changes to notes and deletion of linkages. A change made to a particular heading will be automatically applied to all sub-divisions of that heading as well as to all the bibliographic records using that heading or its sub-divisions. All authority maintenance is performed using this screen, but only intermediate files are updated immediately. The authority files proper, (and search key files) are updated as a subsequent batch process.

Because of the capacity of this screen to affect large numbers of records, users will be required to enter a password to gain access.

(v) **Worksheet Request (BWKS)**

Accepts batch numbers for printing taken from the worksheet status report. This report is produced following AMRS/OWNC input and the worksheets requested are printed following the next batch run.

7. SEARCHING THE FILES

In order to display any record on one of the above screens, either for interrogation or alteration, it is necessary to type in a command and a search-key; (unless the system number is known).

7.1 The first point to note is that the search-keys held on file within ORACLE are complete terms, as opposed to the truncated terms more normally used.

e.g. AUSTRALIA Department of Minerals and Energy

is held on the search file in full, and not, for example, as a (4,3,2,2) truncated key:

AUST;DEP;OF;MI;

The person at the keyboard may type in the complete term, (and obtain a specific response) or may choose to truncate selectively in order to reduce typing effort or to cope with an incomplete or doubtful citation. The only restriction is that the first three characters of the first word must be correctly input; e.g. (AUS/) in the above example.

7.2. The second important point is that search terms are held on file in groups, and it is necessary to specify which group is required, viz:

For Authority Searches	For Bibliographic Searches	MARC Fields Contained
A00	Personal Name (PN)	100,400,600,700,800
A10	Corporate Name (CN)	110,410,610,710,810
		111,411,611,711,811
A40		240,640,740
A41		440,840
A45	Title (T)	645
—		243,245(a,b),745(a)
—		plus (t,u) in 4XX,6XX,
		7XX,8XX
A60	Subject (SUB)	650,651
A90	–	490 (F.I. = 0)
—	Book Number	001,010,021(a)
	(ISBN, LCN or BNB)	
		ORACLE number

From this table it can be seen that series are not in a separate category and that the Subject File covers only topical and geographical subjects. This has two important consequences for bibliographic-searches:

(a) a bibliographic search for a series or subject in **name, title** form can be made solely as a "name" search, or the title only can be searched (as a "title" search).

(b) a bibliographic search for a name alone cannot distinguish between works by or about the author in those cases where the subject heading is simply the author's name with no sub-division.

Searches of the authority file will be carried out by authorities staff, who will thus be able to specify the precise file group required.

7.3 The Symbol (/) referred to above has the meaning: search for keys containing the term, or terms with this combination of characters. The only restriction is that the characters must commence a word e.g. FIS/ would locate Fishing; ING/ would not. It should be noted that this symbol must always be used if there is any doubt as to the fullness of the search term keyboarded, e.g.

SMITH JOHN/ will retrieve SMITH, JOHN 1922–
but SMITH JOHN will not.

To illustrate the use of this symbol:

NATIONAL FOU/ PHE/

would retrieve entries for the National Foundation for the Study of Extra-Terrestrial Phenomena.

A maximum of three truncations may be used.

7.4 For bibliographic searches, two commands are available:

FIND (meaning search this library's file); and

FIND,ALL (meaning search the ORACLE base).

Authorities and book-numbers being centralised, the single command "FIND" will apply to authority and book-number searches.

7.5 The following is the strategy underlying the ORACLE bibliographic search facilities:

(a) if more than one key is found matching the search key submitted, these are displayed in a numbered sequence. The system will stop searching after a specified time interval and return these to the screen with the advice "SEARCH INCOMPLETE: TYPE C IF YOU WISH TO CONTINUE").

(b) if only the one key is found matching the search key submitted, numbered one-line author/title/edition/date citations are displayed for the records associated with this key. If these extend over several screens it will be possible to 'page' through these. The first screen will indicate the total number of records found. (If the system had not finished searching the key file when the time allotted to this task had expired, the one key found would initially be displayed, with the message "SEARCH INCOMPLETE, TYPE C IF YOU WISH TO CONTINUE").

(c) if only one key is found and there is only one record attached, this will be displayed as a full catalogue entry. (If the system had not finished searching the key file when the time allotted to this task had expired, the one key found would initially be displayed, with the message "SEARCH INCOMPLETE: TYPE C IF YOU WISH TO CONTINUE").

It is possible to move between the screens e.g.

(a) if a display of numbered keys is received, the command "CIT,4" would produce a screen showing citations of the records associated with key (4). The command "FULL,6" would give a full catalogue entry for citation (6); "DUMP,6" would give a MARC display for citation (6). The command 'R' will produce the previous screen format (citations) and if repeated, the previous format (keys).

(b) if the screen initially received in response to the search does nto contain the item sought, the user can request that the search be continued (if the system advises that it has not yet been completed), or alternatively elect to add data to the search key in order to make this more specific. (The original key is shown on the screen for this purpose).

7.6 The strategy for authority searches is the same, except that there are only 'key' and 'full' screens.

7.7 The following are some typical search responses:

(a) FIND,PN,DICKENS CHARLES

would produce works by Charles Dickens, and about Charles Dickens (for those books where the subject heading is not in a sub-divided form). It would not locate records in which the name is associated with a title i.e. added entries, subject entries.

(b) FIND,PN,DICKENS CHARLES/

would produce every record with Dickens Charles as heading, or in which Dickens Charles begins the heading.

Thus it will find those records listed as exceptions in (a).

(c) FIND,PN,DICKENS CHARLES DOMBEY AND SON

would both produce records in which the combination Dickens, Charles. Dombey and Son has been used as an added entry or subject heading.

(d) FIND,T,DOMBEY AND SON

would produce all records having Dombey and Son as title e.g. title proper, uniform title, added – entry title and subject title (Dickens, Charles. Dombey and Son).

(e) FIND,T,DOMBEY/

would produce all records in which any of the titles listed in (d) begin with the word DOMBEY.

7.8 When a search is made by ISBN, LCN or BNB there are three possible responses:

(a) full bibliographic screen (record is on file)

(b) MARC Record Not On File (the record is on order from AMRS)

(c) AMRS Order Unsuccessful (plus the date of the order).

8. BUILDING THE CATALOGUE

Catalogue building can be considered as four related activities:

(i) creation of a catalogue record representing the item being added to the collection

(ii) integration of this record into the existing catalogue

(iii) addition of local copy-specific information

(iv) establishment of reference structures for the headings and on-going maintenance of headings in accordance with changes in the standards used e.g. AACR, LCSH.

Considering each of these separately:

8.1 Creation of the Catalogue Record

The cataloguer has three options:

(i) copy records already in the ORACLE Bibliographic Data Base

(ii) purchase centralised machine-readable cataloguing; at present restricted to the Australian MARC Record Service (AMRS)

(iii) own-code original cataloguing or data derived from bibliographies.

8.1.1 Copying records already on file

If a suitable record is found on file, this can be viewed either as a catalogue entry or in MARC format. The command COPY (using UCAT) immediately adds this record to the library's own file, and any alterations/additions can then be made using the same screen. Addition of a holding tag (HLD) completes the cataloguing process and book labels are automatically generated.

8.1.2 Purchasing AMRS records

The book-numbers (with alternatives where available) are entered at a terminal, together with any local data required. These numbers are validated in batch mode and an order sent to AMRS. If multiple book-numbers are provided for a title, ORACLE will automatically re-order under a fresh number should a request fail. Upon receipt of the MARC records from AMRS, printed status reports are produced for each batch. ORACLE-generated worksheets can then be requested, or the records can be edited directly at a terminal using DUMP and UCAT.

8.1.3 Own-coding

There are three alternatives for adding own-coded records to the file:

(i) code on to worksheets and enter using OWNC. The system will respond with worksheets for editing purposes. Alternatively the record can be viewed and edited on-line using DUMP and UCAT.

(ii) code on to worksheets and enter using UCAT. Input is slower and more expensive, but verification against the authority file and MARC specification is instantaneous.

(iii) enter directly using UCAT. This assumes that a cataloguer is operating the terminal, and thus permits the verification facilities to be used most effectively. The messages from the system are being displayed to the person who can best make use of them.

8.2 Integration of the New Record

Any conflict between headings in the new record and headings already in use must be resolved. This conflict can be minimised for own-coding by checking the authority file (using Authorities Citation or Full Authority) before the record is created.

Whenever a new MARC-valid heading enters the system (either from an AMRS record or via an on-line screen), it is added to the authority file and reported to the cataloguer on a printed authorities report. If higher-level headings are required these will be automatically created and reported. If this check revealed a higher-level variant the substitution would be made and reported (unless there is more than one alternative, in which case these are reported to the cataloguer for a decision). If the new heading is already on file as a variant with a single see-reference, the substitution will be made and reported on the worksheet or screen. If more than one see-reference is attached to the variant, these will be reported on the worksheet so that a decision can be made.

If the new authority needs to be altered to conform with a heading already on file (or vice versa) this is done using UPAT.

8.3 Addition of Local Copy-Specific Information

Routinely this will be the local shelf-list number/s and holdings, both of which are added as tag HLD using UCAT. This operation results in the automatic generation of spine and circulation labels during a subsequent batch run.

8.4 Reference Structures and Heading Maintenance

These operations are performed using UPAT. Notes and general explanatory references are accepted without question. See-also references and see-also from tracings are only accepted if the term is on file as an established heading. The appropriate reverse linkage is automatically created.

A see-from tracing is only accepted if the term is not already on file as an established heading, the variant heading plus see-reference is automatically created. Where the tracing will create a new variant heading, it must pass MARC validation. A new variant heading can be created using UPAT, but established headings can be added only from MARC records. Any note, linkage or variant heading can be deleted at any time, with the system automatically deleting associated cross-links e.g. deletion of a variant heading also deletes the "see-from" tracing at the established heading.

When a change is made to a heading, the system automatically applies this change to all sub-divisions of the heading. The change is also reflected in every catalogue record and cross-reference which uses the heading. The system also checks that no unnecessary higher-level headings have been left on file, and creates higher-level headings for the new term if these are needed. Should this check reveal a higher-level variant, the new heading is altered accordingly and the substitution reported to the screen.

The authority control module automatically creates a file of all non-listed series (Tag 490, First Indicator = 0) from incoming MARC records, and reports all new series added. This file provides a record of earlier decisions not to prepare added entries for particular series, as well as retaining a link to those MARC records belonging to the series should retrieval for listing be subsequently required.

There are also facilities to create spelling references of the type "COLOR – Titles and names which commence with the spelling COLOUR are filed as spelt."

All alterations and additions made to the Authority File are reported. Each library receives, in addition to a report on the changes which it initiated, a report of those changes made by other libraries which affected records in its file.

9. MICROFICHE

9.1 Catalogues will be produced on vesicular microfiche (with a silver halide master) at a reduction ratio of 48X. Alternative film stock and reduction ratios are available if required. Catalogues will be generated from collection codes and thus can be produced to represent holdings in any desired combinations of collections. Coloured stripes will distinguish between different sequences of fiche.

Catalogues will be in three parts:

(i) author/title

(ii) subject

(iii) shelf-list.

Each fiche will have eye-legible characters to indicate the library, collection, catalogue, date, alphabetic content and fiche number. Each fiche will contain an index frame. Fiche will contain two columns per frame, with one line between entries and four characters between columns.

Libraries can elect to generate a completely cumulative catalogue with each issue, or cumulative supplements between total cumulations. A record will appear in a supplement if cataloguing was completed or any change was made during the interval covered.

9.2 Punctuation of main-entries will be in accordance with ISBD(M), first standard ed., 1974.

9.3 The filing sequence is based upon the ALA Rules for Filing Catalog Cards, 2nd ed., 1969, together with the draft 1979 edition. A detailed specification is available on request.

9.4 **Entry Format**

Five basic formats are used, depending on the type of entry:

9.4.1 **main entry**

1XX

240 (FI 1,3); 243; 245; 250; 260

300; 4XX

500–513

001

511

ORACLE number HLD ($a,b)

9.4.2 **added title proper and added author (where 1XX is present)**

ADDED ENTRY TERM/S

1XX; 240 (FI 1,3); 243; 250 ($a); 260 ($c)

300

505

ORACLE number HLD ($a,b)

9.4.3 **other added entries (including subjects)**

ADDED ENTRY TERM

1XX; 240 (FI 1,3); 243; 245 ($a,b); 250 ($a); 260 ($c)

300

505

ORACLE number HLD ($a,b)

(If 1XX is absent, 245 $a–e is used)

9.4.4 **shelf-list**

As in 9.4.3 but with the first line replaced by:

HLD ($a,b) ORACLE number

and a tracing block and holdings added.

9.4.5 **analytical entries**

Analytical entries are formatted as in 9.4.1 – 9.4.3. above using tags with the same non-zero level digit. The result is prefixed to a block in format 9.4.3 (minus the added-entry term), prepared from tags with level digit zero.

9.5 **Reference and Notes:**

These are extracted from the authority files as required, viz:

(a)	variants:	when the established heading in the see-reference (or a sub-division thereof) appears in the catalogue
(b)	blanket variants (i e. those with no see-reference):	all catalogues
(c)	general explanatory see and see-also references:	when the heading with the reference (or a sub-division thereof) appears in the catalogue. If only a sub-division appears in the catalogue also extract the heading to which the gesr or gesar is attached and display it with its gesr/gesar
(d)	see-also references:	when the heading with the see-also (or sub-division thereof) appears in the catalogue, and the heading to which the see-also directs, or a sub-division thereof, appears in the catalogue. If the heading with the see-also attached is not used (but only a sub-division) extract the heading to which the see-also is attached and display it with the see-also.
(e)	notes (other than Cataloguers Notes):	when the heading with the note, or a sub-division thereof, is used in the catalogue. If only a sub-division is used, extract the heading to which the note is attached and display it with the note.
(f)	spelling references:	when the spelling to which the user is referred begins an entry, (either alone or as a longer word).

9.6 **Samples Entries**

Abbreviated entries (added entries and analytics) are indicated by an asterisk prefixing the ORACLE number: further information is available at the main entry. To enable users to readily determine the main entry term this always appears as the first indented line in an added entry:

(a) **Main entry**

FRIEDBERG, M. Paul
[Handicrafted playgrounds].– Do it yourself playgrounds/
by M. Paul Friedberg. – London : Architectural Press,1975.
123p.: chiefly ill; 27 cm. – (Architectural series: no. 7)
Originally published as : 'Handicrafted palygrounds'.
New York : Vintage Books, 1975.
Includes bibliography.
ISBN 0 – 85139 – 175 – 3 Pbk

74333678

ANF 790.068 FRI
ANFR 790.068 FRI

(b) **Added uniform title**

HANDICRAFTED playgrounds
Friedberg, M. Paul. Handicrafted playgrounds.
Do it yourself playgrounds. 1975.
123p. : chiefly illus.; 27 cm.

ANF 790.068 FRI
*74333678 ANFR 790.068 FRI

(c) **Added title proper**

DO it yourself playgrounds. 1975.
Friedberg, M. Paul. Handicrafted playgrounds. 1975.
123p. : chiefly illus.; 27 cm.

ANF 790.068 FRI
*74333678 ANFR 790.068 FRI

(d) **Added name series**

NEW SOUTH WALES. Fisheries and Oceanic Surveys Department
Fishing notes; no. 2
Gray, Charles, 1940– . The habits of tuna. 4th ed.
1966.
45p. : illus.; 26 cm
*00778822 ANF 636.872 GRA

(e) **Added title series**

STUDIES in linguistics; 42
The influence of Nordic culture on the language
of lower Saxony/by the staff of Manchester University.
3rd ed. 1966,1977.
312p. ; 26 cm.
*12341234 ANF 426.33 NF

(f) **Added subject**

DICKENS, Charles. David Copperfield
Manning, Claud 1900– . Copperfield revisited. 1970.
210p. ; 28 cm.
*00011122 ANF 823.66 MAN

(g) **Added Author/title**

STEINBERG, Jacob
Pictures of fairyland
George, Michael, 1922– . Twentieth century
illustrators. Revised ed. 1972.
600p. : illus. ; 26 cm.
*00668899 ANF 746.663 GEO

PATRICK, Paula, illus.
Barrack-room ballads. The complete barrack room
ballards of Rudyard Kipling.
Kipling, Rudyard. Barrack room ballads. 1973.
xii; 466p. : illus. ; 26 cm.
*00011199 NAF 821.8 KIP

TIBBS, Virgil, illus.
Bible. Old Testament. Song of Solomon. English. 1972. The song of songs which is Solomon's. 1972.
250p. : illus. ; 26 cm.
*01201233 ANF 220.66 BIB

(h) **Added title**

PICTURES of fairyland
George, Michael, 1922– . Twentieth century illustrators. Revised ed. 1972.
600p. : illus. ; 26 cm.
*00668899 ANF 746.663 GEO

(i) **Shelf-list**

ANF 329.994 AUS 00667722
Australian Labor Party. Queensland Branch.
Labor's campaign manuals, 1932/ Edited by W. Forgan Smith. Brisbane. 1932.
48p. : illus. ; port. ; 21 cm.
: 1 copy
1. Campaign literature, 1932 2. Elections – Queensland 3. Smith, William Forgan

(j) **Analytical entries**

(a) ELLIOT, Sumner Locke
Dusty bugles
24p. ; 23 cm.
In: Hangar, Eunice. Three Australian plays. 2nd. ed. 1975.
200p. ; 26 cm.
*3094761 ANF 822.91 HAN

(a) GOLDMINING – Victoria
The first years of the rush (p.66–71)
6p.
In: The golden years/ by Geo. Brown and others from the staff of The Herald. 1975.
400 p. : illus. ; 34 cm.
*66661122 ANF 683.60944 GOL

(k) **References and notes**

BOOKS AND READING
Here are entered works on the significance of books in man's life
See also Annuals
Best sellers
Book selection
sub-division Books and reading under names of persons

BOOKS AND READING – Periodicals
see also Antiquarian literature

BOOKS AND READING – Periodicals
Entry 1
Entry 2

10. BOOK LABELS

Upon receipt of the shelf-list number and holdings (via OWNC or UCAT), the system will generate the appropriate number of spine and machine-readable labels (and also create location records for the Circulation Sub-System). One set of labels will be produced for each physical part shown in the volume description (sub-field (d) of the holdings tag).

The spine label will show:

Collection Code
Class Number
Suffix
Volume Description
Copy Number

The machine-readable label will show a bibliographic citation (author title, edition and date), truncated if necessary, together with the machine-readable book number for circulation purposes. This will be affixed inside the front cover of the book.

System flexibility would enable a user to elect not to generate book labels and/or circulation records.

11. STATISTICS

The system provides a range of statistics to serve as indicators of cataloguing activity and collection growth, as well as providing management data relevant to the overall systems operation.

For each user, the system provides statistics as follows:

11.1 Total Output (by collection code, and overall)

(a) titles catalogued/deleted

(b) volumes added/deleted

(c) current title and volume totals.

11.2 Analysis of New Records by Record Source

(a) own-coded (by collection code and overall)

(b) copied

(c) ex AMRS

(i) ordered

(ii) received (by collection code and overall)

(iii) failed.

11.3 Analysis of Changes Made (for each source type and overall)

(a) additions

(b) deletions

(c) changes

(d) total number of records altered.

Separate statistics will be supplied for authority file data.

11.4 Authorities

11.4.1 Establishment statistics.

(Those concerned with establishing new MARC Records). The following list refers to new headings only:

(a) headings added by system from new MARC records

(b) headings added by cataloguers

(c) system generated higher-level headings

(d) headings changed by system (automatic substitution)

(e) headings changed by cataloguers

(f) see-also links created

(g) see-references created.

11.4.2 Maintenance statistics.

(Those concerned with keeping the Authority file accurate and current).

(a) headings changed by system (i.e. automatic alterations to sub-divided headings)

(b) headings changed by cataloguers

(c) headings deleted

(d) see-also links created

(e) see-references created

(f) spelling references created.

PART 3

THE CIRCULATION SUB–SYSTEM

1. Overview

2. Equipment

3. Loan Types

4. Borrower Records

5. Item Records

6. Operating the On-Line Terminal

   6.1 Charging

   6.2 Discharging

   6.3 Renewals

   6.4 Reservations

   6.5 Recalls

   6.6 Missing Copies and Withdrawals

   6.7 Borrower Details

7. Output

   7.1 Notices

   7.2 Borrower Listings

   7.3 Item Listings

   7.4 Statistics

1. OVERVIEW

The ORACLE system gives real-time circulation control over all catalogued material in the library's collection, whether this is on loan or on the shelf.

All data from the light-wand or keyboard (loans, returns, renewals, reservations, recalls, withdrawals, suspensions/re-instatements and new borrowers) updates the files as it is entered, and this information is immediately available, in full, at every ORACLE terminal in the library.

Overdue items are automatically detected during batch processing and notices generated and a range of listings and statistical reports are produced.

The Circulation Sub-System is one module of the ORACLE integrated library processing system, and thus loans' desk staff have on-line access to both acquisitions and cataloguing records as required.

The Sub-System in its present form is oriented to the needs of the Library Board of Queensland and it is expected that other users of the system may be interested in developing features additional to those currently provided.

2. EQUIPMENT

The system operates on-line to the CYBER mainframe and users may select the most appropriate mode of data entry.

The initial application employs an Optical Character Recognition (OCR–A) light-wand and a terminal equipped with screen, keyboard and micro-processor. The keyboard is used to vary the loan type, interrogate the on-line files, add reservations etc., as well as providing an alternative data entry mode should the light-wand fail.

The micro-processor performs initial processing only with all files being held in the CYBER mainframe. The terminal also controls a 'daisy-wheel' printer used for the production of book labels, recalls and overdue notices. Interchangeable wheels provide normal and OCR–A type faces as required.

Should the line or mainframe be out of operation for any reason, the terminal takes loans data input by the light-wand and prints this using the OCR–A printer. The information can then be re-entered using the wand once communications are re-established.

3. LOAN TYPES

Each library is able to specify a range of loan types and the following are those currently in use:

Loan Type	Maximum Items	Loan Period	Renewable
Permanent	–	permanent	–
Semi–Permanent	per capita formula	4 years	yes
Bulk	1000	6 months	no
Institutional	500	3 months	once
Personal (Isolated)	16	2 months	yes
Personal (Other)	8	4 weeks	yes
Family (Isolated)	members x 16	2 months	yes
Family (Other)	members x 8	4 weeks	yes
Inter Library Loan	no limit	6 weeks	yes
Short Term	10	6 weeks	yes
Internal	no limit	2 months	yes

These loan types are allocated to borrowers according to their category (libraries, individuals etc.). The internal loan is used for material on display, in bindery etc., and can also provide a mechanism to create a very flexible "Reserve" collection of material which is not to be borrowed.

4. BORROWER RECORDS

For each borrower the system holds:

(a) **personal information –**

name; address; telephone number; status; borrower type and number; loan entitlements; date and branch of registration;

(b) **details of the loans held –**

title; loan type; date due; date recalled; date and type of last overdue notice sent.

All of the above information is available from the on-line BORROWER screen, although for organisational borrowers a summary only of the loans is provided. Listings of organisational loans can be produced for any borrower as required and these also serve as catalogues for use within the organisation.

Two specialised areas of the Library Board's operation are the supply of processed bookstock to libraries participating in the Public Libraries Service Scheme and the provision of a lending service to those Queensland residents who do not have a local free library service. The ORACLE circulation system makes special provisions for both:

(i) libraries in the Public Libraries Service Scheme. The on-line screen displays the theoretical bookstock both before and after an exchange (based on a per capita formula), together with the actual stock at the time the inquiry was made.

(ii) history files of previous loans can be kept (if requested by the borrower) to prevent a title being sent twice to the same person. (Most users of the service live too far away to call personally and frequently rely upon the librarian's selection).

The on-line borrower files can be searched by name or system number.

5. ITEM RECORDS

The LOCATIONS screen gives the whereabouts of every volume in the library's collection, together with loan details if applicable viz:

borrower and number; loan type; date due; date recalled; date and type of the last overdue notice sent.

(If an item has been on-loan and returned, it is possible to retrieve on-line the name of the last borrower should this be required). The screen will also show if a copy is missing or has been withdrawn from stock; (withdrawn volumes are extracted to microfiche annually). If no copies of the title are on-shelf, this screen will also display the number of reservations currently held and the number of copies on order. Further screens can be called to give details of each.

The LOCATIONS screen is central to the entire Circulation Sub-System, since it provides loans staff with the current status of all copies of the title sought. From this screen books can be recalled, reservations can be displayed, placed or deleted and books can be altered to missing or withdrawn status.

6. OPERATING THE ON-LINE TERMINAL

In order to provide the flexibility necessary in a lending operation, most system restrictions can be circumvented when necessary by use of an override facility. The control of this facility is a matter for individual library practice.

An audio signal will accompany any exception message, in order to draw the operator's attention to the screen.

6.1 Charging

Items will normally be charged by wanding the book and borrower numbers, although these can be keyboarded if necessary. If several items are being charged to the same borrower the borrower's card is wanded only once. Charges will be rejected if the borrower is barred (giving the reason), ineligible for the loan type or has exceeded his limit.

Loans will also be rejected if the book is reserved for another borrower with higher priority, or is already recorded as being on loan. A successful charge responds with the new loans total and the date due.

6.2 Discharging

Discharging requires only the book number. The system will indicate if a reservation is outstanding (giving the borrower's name).

6.3 Renewals

These are accepted provided the item is on-loan to the borrower, no reservations are held and renewal is possible. Eligibility to borrow is rechecked.

The system responds with the new date due.

6.4 Reservations

Reservations are placed real-time on the library's total stock of the title (including material on-order or in-process) and are allocated during discharging in the order in which they were placed.

A reservation is made simply by entering the command (RES, Borrower Number) at the LOCATION screen. An earlier date may be added to give the reservation priority over those on file.

The system will reject a reservation if a copy is shown as being on the shelf.

6.5 Recalls

The LOCATIONS screen allows the librarian to decide which copy to recall, and will accept an instruction to this effect; (RECALL, 99 where 99 is the sequence number of the copy to be recalled). A recall notice is automatically generated on the adjacent printer.

6.6 Missing Copies and Withdrawals

The location of any copy can be altered on-line to 'missing' or 'withdrawn'. Review lists of missing items are produced on a quarterly basis and withdrawn items are extracted annually

to microfiche. The last known location of a missing item is available on-line.

6.7 Borrower Details

Borrower records can be altered real-time (including the suspension of borrowing privileges) and new borrowers can be added in the same mode. When a new borrower is added, the system responds with a borrower number and loans can commence immediately.

7. NOTICES

7.1 Notices

The system immediately prints recall notices when instructed to do so by the operator. Overdue items are detected automatically during batch runs and notices printed accordingly. The first is generated two weeks after the date due has passed, with three subsequent notices, each at two-weekly intervals. The fourth notice automatically alters the status of the item from 'on-loan' to 'missing'; (the borrower's number being retained). Each user may specify individual overdue cycles.

7.2 Borrower Listings

(a) Alphabetical lists of borrowers are regularly produced, showing category, address, telephone number and system number together with their current status, viz. valid, barred, inoperative (no transactions in the previous twelve months).

(b) Lists are produced on demand for organisational borrowers showing the material they hold on longer-term loans. These serve both as local catalogues and overdue listings. Lists of inter-library and internal loans can be printed as required.

(c) Lists of previous loans can be produced (if requested by the borrower) and these are used by library staff to avoid sending duplicated items in the next loan.

7.3 Item Listings

(a) A fortnightly list is produced of reserves outstanding longer than eight weeks, and this shows the title, date placed and the borrower's name.

(b) Quarterly lists show those items which have been flagged as missing for the past twelve months and also give the date and name of the last known location.

(c) Microfiche lists of withdrawn items are produced annually.

7.4 Statistics

The ORACLE Circulation Sub-System produces an extensive array of detailed management statistics viz:

(a) Total loans are analysed by loan type, category of material and borrower type and categories of material are analysed by loan type and borrower type. Loan types are analysed by borrower type.

(b) Returns are analysed by loan type.

(c) Totals are supplied of reserves placed and successful, recalls and overdue notices generated (the latter analysed by type), items missing and withdrawn and borrowers added and deleted (by category).

These statistics are produced monthly, together with the annual total to date.

PART 4

THE ACQUISITIONS SUB–SYSTEM

1. Overview
2. Pre-Order Searching
3. Placing the Order
4. Interim Correspondence
5. Recording Receipt
6. Budgetary Information
7. Output

1. OVERVIEW

The ORACLE Acquisitions module is still in the early stages of design, and the system in its final form may not correspond precisely to the description given below. No major departures are foreseen.

The Sub-System will provide facilities to create and maintain acquisitions records for library materials from the time of selection through to receipt. Standing orders can be maintained (although this facility does not extend to serial items requiring automatic periodic re-ordering), and unsolicited and donated material can be processed into the collection.

Acquisitions records are added, maintained and available on-line and the sub-system forms part of the integrated ORACLE library processing system. As such, the module also shares the systems multi-user capabilities. Any entry in the Bibliographic file can be used by each user to create acquisitions records and purchase orders. Information that a user has a title on-order is available to all other users.

The sub-system is also inter-linked to the Circulation and Cataloguing modules. Acquisitions staff can place reservations on titles at the time of ordering; the acquisitions record is transformed into the cataloguing record at the time of receipt; and all staff have access to the current status of any item from the time the order is placed.

Purchase orders, claim letters and management statistics are generated during batch processing and an up-to-date synopsis of the budgetary status is available on-line.

2. PRE-ORDER SEARCHING

Selection staff have at their fingertips the full on-line searching capabilities of the ORACLE system. This covers name, title, series, subject and book-numbers, with the facility to truncate the search term to as little as the first three characters of the first word.

The searcher may elect to see a list of those libraries which either hold the title or have placed an order, or a detailed analysis of his own library's holdings and orders.

Access to orders placed is available by the normal ORACLE search facilities and also by the order number.

3. PLACING THE ORDER

An order may be conveniently considered as three components:

(a) bibliographic data

(b) specific requirements

(c) supplier details.

3.1 Bibliographic Data

3.1.1 If the bibliographical record is found in the ORACLE master file, the operator needs only to request an ORDER screen. A formatted screen will then be displayed containing the appropriate bibliographic elements from the master file record.

3.1.2 If the record is not already on file, the operator requests an ORDER screen and adds as

many of the following data elements as are necessary to adequately described the item being ordered:

(a) Author

(b) Title (with medium if appropriate e.g. sound recording)

(c) Edition

(d) Imprint

(e) ISBN/S and LCN

(f) Series.

Although this information will be added to the Bibliographic master file, it is likely that AusMARC coding of the data will not be required. Book number search keys are immediately created in order to give real-time duplication checking during pre-order searching.

3.2 Specific Requirements

The bibliographic data of 3.1 defines the particular title, edition and imprint required. The following data provides additional requirements or information specific to this order viz:

(a) Volumes or parts required

(b) Number of copies

(c) Estimated price (For frequently used currencies the system will automatically convert to Australian dollars; other currencies require pre-conversion. This field is set at zero for gratis material).

(d) Account number and financial year to be encumbered

(e) User for which the title is being ordered (Provided by the system but alterable under certain conditions)

(f) Collection for which the title is being ordered

(g) Order/Indent number (The system generates an item specific order number, but some accounting systems will require an additional external number)

(h) Availability note (For more obscure material)

(i) Codes for the selector and citation

(j) Date placed (System generated)

(k) Standing order (if applicable)

(l) Claim period and expiry date.

From the above, it will be seen that the system has the facility to accept orders on behalf of another user. This will be under strict system control and only be possible when two users mutually agree to such an arrangement.

3.3 Supplier Details

To avoid repetition of supplier information, the system will hold full details of all frequently used suppliers in an updateable file, and extract this data in response to a code input at the ORDER screen. These records will provide the name, address, standard claiming period and

order expiry period and it will be possible to vary the last two items on any specific order.

When a non-listed supplier is requested, the name and address are entered in the Availability Note (3.2 (h) above) and this is used in generating the purchase order. The Availability Note, when used on an order with a listed supplier, is printed on the purchase order form.

4. INTERIM CORRESPONDENCE

On-line facilities will be provided to record the various correspondence which may be sent and received before the order if finalised.

At the time the order is placed, the system will automatically set both a claiming date and an expiry date based upon the supplier's profile. If these are inappropriate to the order being created, they may be varied on-line at that time. A claim will be produced if the order is not fulfilled by the due date and this will also inform the supplier of the data upon which the order will be cancelled failing receipt of the item.

Claim stationery will allow for both partial receipt and missing items from standing orders to be drawn to the supplier's attention.

As reports are received from the supplier on the progress of an order, (reasons for delays, supply of alternative bindings etc.) these can be recorded on-line and the claiming and expiry dates adjusted where necessary.

Any correspondence to the supplier (return of defective copies, requesting invoices etc.) can also be added to the on-line record of the order.

An order may be cancelled at any time, with an automatic adjustment being made to the outstanding encumbrances.

5. RECORDING RECEIPT

An on-line screen is available for recording the receipt of items ordered, together with the relevant invoice numbers and prices charged where applicable. A purchased item received without an invoice may be entered and the invoicing details added when available. (A subsequent batch run produces a control listing of all such material for which invoices were not subsequently received). A similar facility will cater for pre-payment i.e. invoices received before the items.

The system will also cater for the receipt of unsolicited donations and material received 'on-approval' or under blanket order arrangements. Upon being informed by the operator that the order has been completed, the system will alter the record status accordingly and proceed with an order for centralised cataloguing data if this is required.

6. BUDGETARY INFORMATION

The system maintains an on-line record of allocations, outstanding encumbrances and disbursements and thereby provides acquisitions staff with a detailed analysis by account of uncommitted funds at any point in the ordering year. ORACLE does not as yet have an accounting module and the system is not involved in cheque production or accounting balances. For every title acquired, a permanent record is

kept of dates, supplier, order and invoice numbers and the quoted and actual prices. This information is held on-line for twelve months and then extracted to microfiche.

The facility exists to adjust the outstanding encumbrances to reflect significant changes to international exchange rates and to transfer outstanding encumbrances to the next financial cycle.

7. OUTPUT

7.1 Multi-part order forms will be produced for despatch to suppliers and these will be followed by claim notices as necessary. Regular reports will itemise those chargeable items received but not yet invoiced and vice versa. Lists of current suppliers will be available. The file of completed orders will be extracted to microfiche annually.

7.2 The system will provide a range of statistics designed to monitor mode of acquisition, expenditure, prices, collection growth and supplier performance.

Acquisitions staff will have on-line access to the current status of each budgetary account viz, allocation, outstanding encumbrances, disbursements and the free balance and this information will also be available further sub-divided by collection categories within accounts.

Statistics will be produced showing the number of volumes ordered and received and the variations between quoted and actual prices, as well as average prices, will be monitored.

Supplier performance can be evaluated in terms of item charges, claims sent, delivery times and cancellations.

PART 5

A SYSTEMS OVERVIEW

1. Computer Facilities
2. Overview
3. Cataloguing Sub-System
4. Circulation Sub-System
5. Acquisitions Sub-System

1. COMPUTER FACILITIES

ORACLE is only one of several on-line systems currently in use at the S.G.I.O. with the largest being "INSURE" (Information Network for S.G.I.O. Using Real-time Enquiry) which handles most types of insurance business, including Fire, Life, Comprehensive Motor Vehicle, Workers' Compensation and General and Accident Insurance.

The current S.G.I.O. computer complex comprises twin Control Data CYBER 70 Model 72 computers (each with 96K 60-bit words of central memory) and each processor having access to:

- 123K 60-bit words of extended core storage (ECS)
- 2.4×10^9 characters of disc storage
- 8 7-track magnetic tape drives
- 3 1000 l.p.m. printers
- 1 card reader
- 1 paper tape reader/punch
- 2 Communications Processors controlling about 90 Visual Display Terminals, about 20 terminal printers and a remote Job Entry Terminal available to programming staff for program development and testing.

Terminals being used by the Library are CDC 714/30 and 714/125 models. The screens are presented using "inverse video" to highlight the distinction between data and heading information.

2. OVERVIEW

2.1 ORACLE is basically an on-line system supported by batch processes where needed e.g. production of COM (Computer Output Microfiche) catalogues. The on-line facilities available to the user have been designed from a user's point of view in that use of codes are minimised. As an example, a user may obtain a specific title in the System without ever having to enter its unique system code. The entering of data that is relevant to a librarian such as title, author, subject etc. provides access to any part of the system. The only extensive use of codes by ORACLE is that required to support the MARC Record format, such as field or tag identifiers for bibliographic information.

All files stored on mass storage are Indexed Sequential in organisation and sorted by key, thereby lending themselves to either direct access by key or serial reading.

In order to facilitate the incorporation of new Library users at any time and to allow them to become active participants in as short a time as possible, programs are entirely dependent on the data base, i.e. no re-compiliation of programs is necessary.

For each new user wishing to enter the system, an identification record is simply added to the user's holdings and amendment file.

All programs that perform any I–O on the data base do so through common-decks of code, so that if any alteration to a file layout is made, it may be reflected by only one change to a common-deck which is contained in all programs using that file.

Each sub-system of ORACLE has its own separate physical files so as to reduce response delays

due to file inter-locks and to support the modular design concept of the overall system.

2.2 The system has a number of significant advantages:

(i) It is written in COBOL, thus giving it the advantages applicable to high level languages.

(ii) It is modular in design, thus making it extremely easy to add new segments.

(iii) All enquiries are of equal priority.

(iv) Any number of Libraries may use the same Bibliographic Data Base.

(v) A Library may become an active participant within ORACLE in a very short time.

(vi) An on-line Union Catalogue is available to all users of the system.

(vii) The system is user oriented.

3. CATALOGUING SUB-SYSTEM

3.1 The cataloguing data bank is comprised of four (4) types of files being:

1. ORACLE Master File
2. Library Users' Holdings and Amendment Files
3. Search Files
4. Authority Control Files.

These files are also divided, either logically or physically, into several sub-files to support the Automated Authority Control. (Fig. 1.)

3.1.1 The central ORACLE Master File contains all Bibliographic information i.e. MARC record. These records may be shared by any number of users, but if a user changes a record, his change is reflected by updating the Library User's Amendment File. It should be noted that the entire MARC record is not duplicated on the Library User's Amendment File, but only that field or tag that was changed, thereby reducing the amount of mass storage needed. In this way any number of users may change a MARC record to meet their internal requirements without affecting other users.

3.1.2 The Holdings and Amendment File contains all holdings information of a particular bibliographic record and these are unique for each user. Also, as mentioned above, the file contains all changes to bibliographic records made by each user. When a user makes any enquiry on-line, the system obtains the MARC record from the ORACLE Master File and then proceeds to overlay it with any changes made by that user prior to transmission, thereby simulating a unique MARC record for each user. It should be mentioned, though, that any changes made to MARC records which would effect the Search Files are always applied to the ORACLE Master File as no facilities as yet, exist to access the Catalogue Data Bank via data contained on the Holdings and Amendment File.

3.1.3 The Search Files are designed and used for the following three (3) purposes:

1. As an index to records in the ORACLE Master File.
2. As an index to records in the Authority Control Files.
3. As the primary means of controlling Authority Headings.

The primary keys in the Search Files are fairly long with Corporate Name Index being 100 characters in length and all other keys being 50 characters. The key is generated from bibliographic information by removing all special characters and sub-field codes and converting all alphabetics from a MARC record field or tag to upper case. As the files will not support duplicate keys it thereby becomes a simple process to eliminate the possibility of an Authority Heading being duplicated, as each heading generates its own unique key.

Each Search Record contains the keys to all bibliographic records which use it and to which users use that bibliographic record, as well as in the case of an authority, the key to its unique Authority Heading. Also, a Search Record is created for each Variant Heading or Spelling Reference that is added to the Authority Control Data Base.

3.1.4 The Authority Control File contains all established headings, variant headings, linkages (i.e. x, xx, see, sa), catalogue notes and spelling references. Established headings may only be added to this file as a direct result of a MARC Tag, which is not already on the Authority Control File, being added to the ORACLE Master File. Variants may be added, with the subsequent addition of a Search Record, only when they do not duplicate an existing established heading. All other records on the file are considered trailer records as they can only be present under an established or variant heading record. It should be noted that linkage records contain only an 8 digit "system assigned" number that points to that heading containing the data necessary to provide authority information and is entirely transparent to a user.

3.2 The cataloguing Sub-System is entirely independent of the Circulation and Acquisitions Sub-Systems. This is achieved by the modular design of the overall system in that the Catalogue Data Bank is entirely separate from other Data Banks within ORACLE.

Figures 3 through 7.1 give descriptions of the processing of data through the Cataloguing Sub-System and for the production of COM Catalogues.

3.3 **On-Line Processing**

3.3.1 On-line updating in the Cataloguing Sub-system is limited to the ORACLE Master File, Holdings and Amendment Files and a Transaction File. The first two files are updated in real-time, but very rarely are both updated as a result of the one input transaction. As considerable processing may need to be accomplished to reflect updated bibliographic data in authorities or search files, a transaction record is created containing data as to the state of the respective record prior to and after the change was applied, as well as to which user instigated the change. The transaction file is then used as input to batch processes to update all other relevant cataloguing files and to support the accumulation of statistics.

It should be noted that this transaction file is also used to facilitate recovery procedures in the event the data base is corrupted.

3.3.2 On-line updating of the Authority Control Files is again simulated by using the transaction file. Instead of updating the Authority Control File in real-time, the valid data input is written to the transaction file and any subsequent enquiry will result with the transaction being displayed at a VDU thereby giving a real-time status for that authority record.

4. CIRCULATION SUB-SYSTEM

4.1 The Circulation Data Bank is comprised of four (4) types of files (See Figure 2) being:

1. Circulation Records
2. Borrower Loan Records
3. Reservations File
4. Borrower Loan History Files.

4.1.1 The Circulation File contains a record for each physical book held by a library. The index key to the file is the 14 digit circulation number. Once a circulation record is created it never varies in length regardless of the book being on loan or on the shelf.

4.1.2 The Borrower Loan File contains two (2) types of records. One is the personal borrower information, e.g. name, address etc. and the other records being loan records consisting of book numbers which are held by that borrower. Both the Circulation File and Borrower Loan File are inverted against each other so that on-line enquiries concerning which books a borrower has on loan or the locations of all books for a specific title may be obtained real-time. Also an inverted file by borrower name and address is maintained to support on-line enquiries by borrower name and address.

4.1.3 The Reservations File contains all current reservations known to ORACLE. The key is a title number followed by the date the reservation was placed. As reservations are placed by title and are not copy-specific, no circulation number is stored within this file. With the date also placed in the key a chronological sequence is effected with the oldest reservation for a title being the first record on file for that title. Also the file is inverted against itself by borrower number.

4.1.4 The Borrower History Files are the only files in circulation that are held off-line. These files contain data concerning the times when a borrower had a book and what that book was. These files are normally only used for the Public Library Service Branch of the Queensland State Library to support their country lending service.

4.2 On-Line Processing

The majority of the Circulation Sub-System is real-time processing with the entire Circulation Data Bank being updated by the use of an O.C.R. light-wand connected to an ECS 4500 visual display terminal and printer. Communications between this terminal and the Cyber mainframe are conducted using a "3270" protocol while all other communications utilise the C.D.C. "mode 4C" protocol.

The system has been designed so that the actual source of the data is irrelevant. This is accomplished by pre-processing in the terminal to remove the "function code" and means that in case of light-wand failure books can still be charged and discharged using the terminal keyboard. This facility is particularly advantageous in the situation where a user does not wish to purchase a light-wand but still desires to make use of the facility.

4.3 Batch Processing

Very little batch processing is required to support circulation. Presently only statistics are gathered of on-line transactions and the processing of loan history where needed. The Circulation

Sub-System is dependent on the Cataloguing Sub-System in that holdings information is input only via the on-line catalogue programs (UCAT or OWNC) at this time.

The input of such bibliographic information as author and title etc. through the cataloguing system assists the user greatly in that it permits the location of books for circulation purposes using the author, title etc. rather than numbers or codes. Because of this integration of cataloguing and circulation systems, the use by any library of the circulation facilities by themselves would be less eficient than for a library utilising both cataloguing and circulation.

5. ACQUISITIONS SUB-SYSTEM

5.1 The Acquisition Sub-System has yet to be fully designed, but the following should provide a basic description of the Sub-System.

The Acquisitions data bank will be comprised of three (3) types of files being:

1. Purchasing File
2. Supplier-Details
3. ORACLE Master File.

5.1.1 The Purchasing File will contain specific requirements of an order and will be linked to the ORACLE Master File. As bibliographic data is contained on each order, it will be stored on the ORACLE Master File thereby being available to all enquiry facilities of the Cataloguing Sub-System.

5.1.2 The Supplier-Details File will be keyed by a system assigned number and contain details of frequently used suppliers. This file will be maintained by on-line updating.

5.1.3 As mentioned above the ORACLE Master File will contain bibliographic data concerning the order and it will be shown initially on the master file as being "on order". Once the order is received it will then be a simple process to change this so as to indicate "in-process".

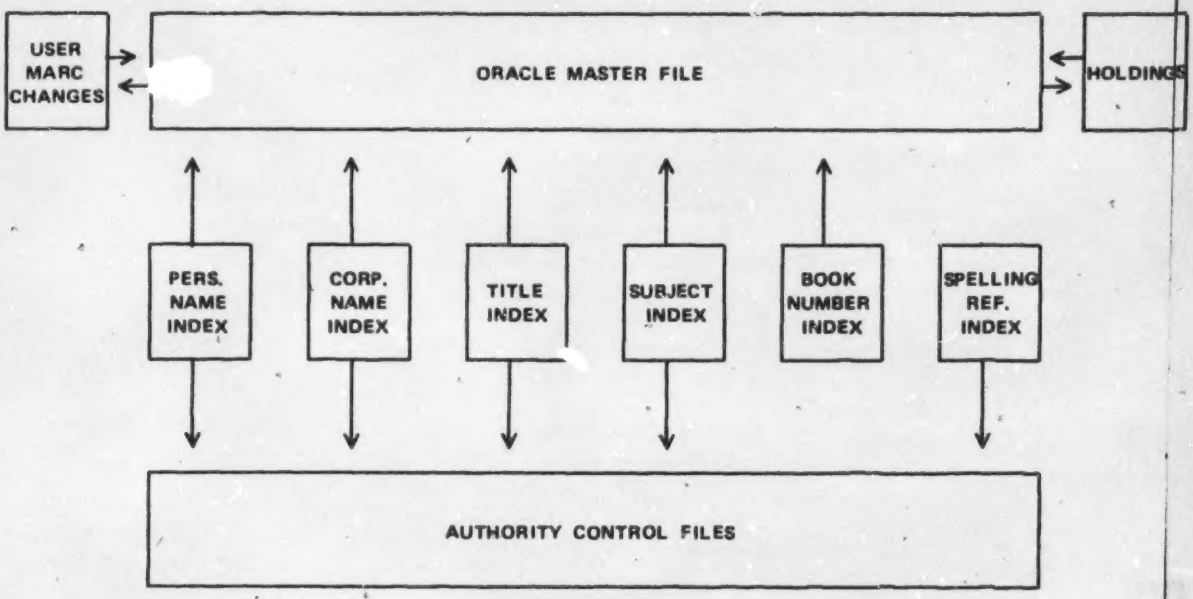
Subsequent replacement of the bibliographic data by an own-coded or AMRS MARC record will then be achieved by the Cataloguing Sub-System to make the book(s) active members of ORACLE.

Orders placed on-line will subsequently be batch processed to produce purchase orders and the various statistics being gathered.

5.2 On-Line Processing

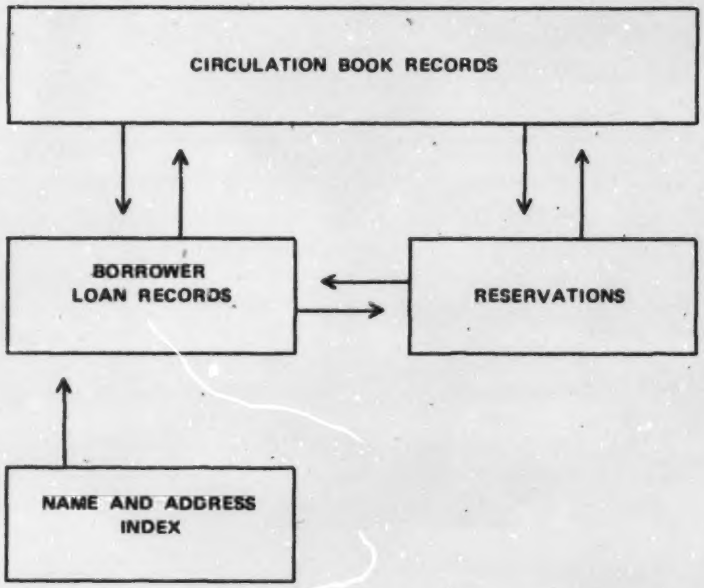
Basically only two (2) on-line updating programs will be needed to support Acquisitions. One Being to handle all details concerning an order e.g. purchasing, receipts and enquiry, etc. with the other being the updating of the Supplier Detail File.

FIGURE 1.



OVERVIEW OF THE CATALOGUING DATA BANK

FIGURE 2.



OVERVIEW OF THE CIRCULATION DATA BANK

FIGURE 3.

PROCESSING OF AMRS MARC ORDERS

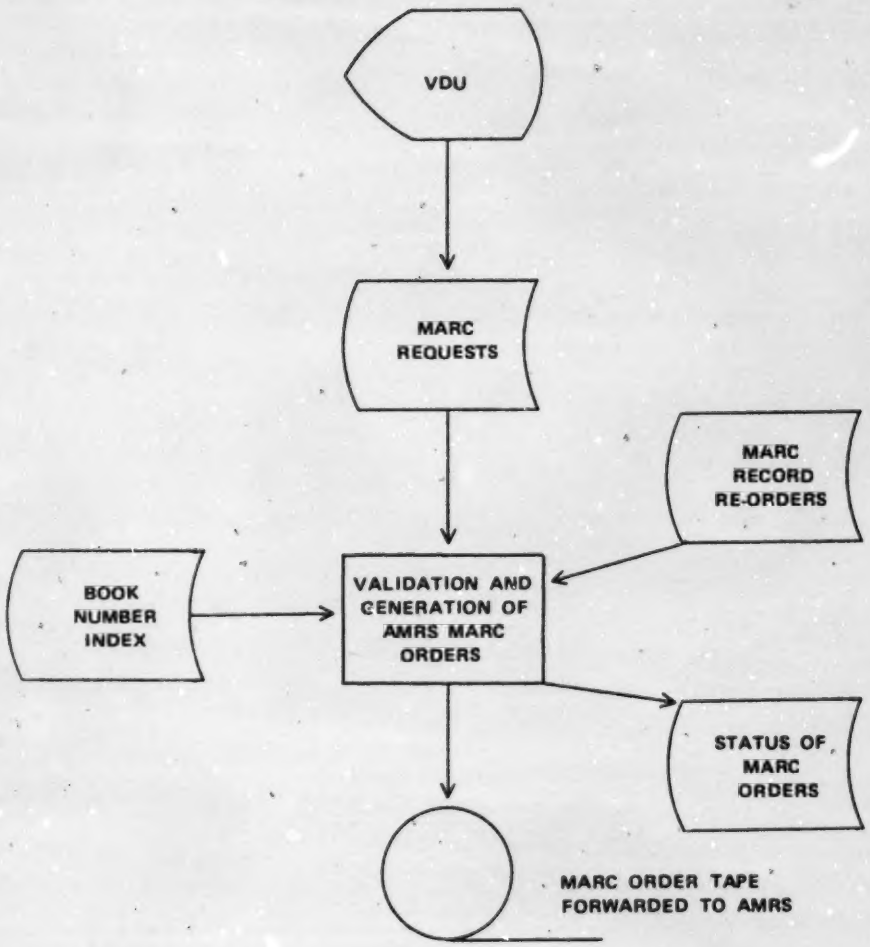
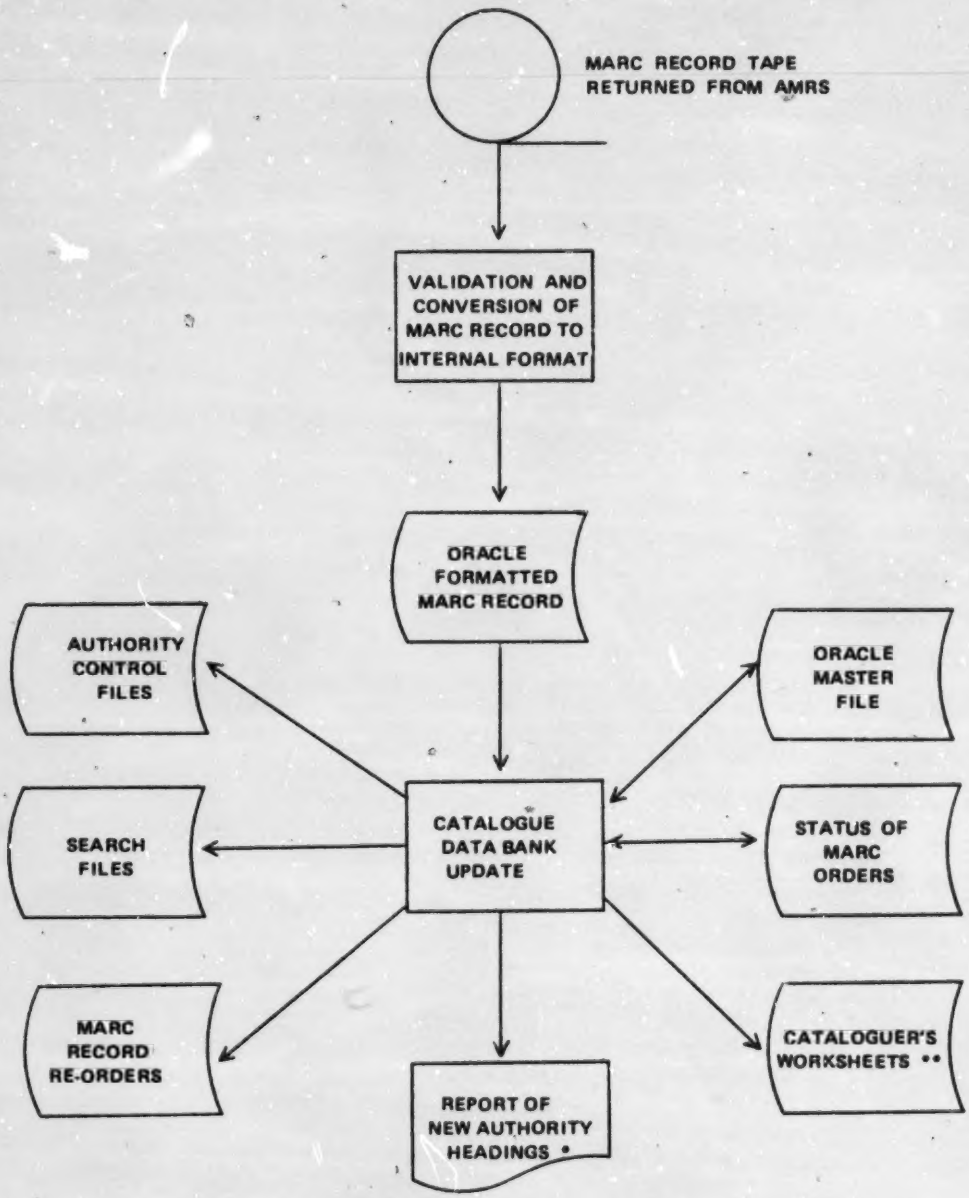


FIGURE 4.

PROCESSING MARC RECORDS RETURNED FROM AMRS

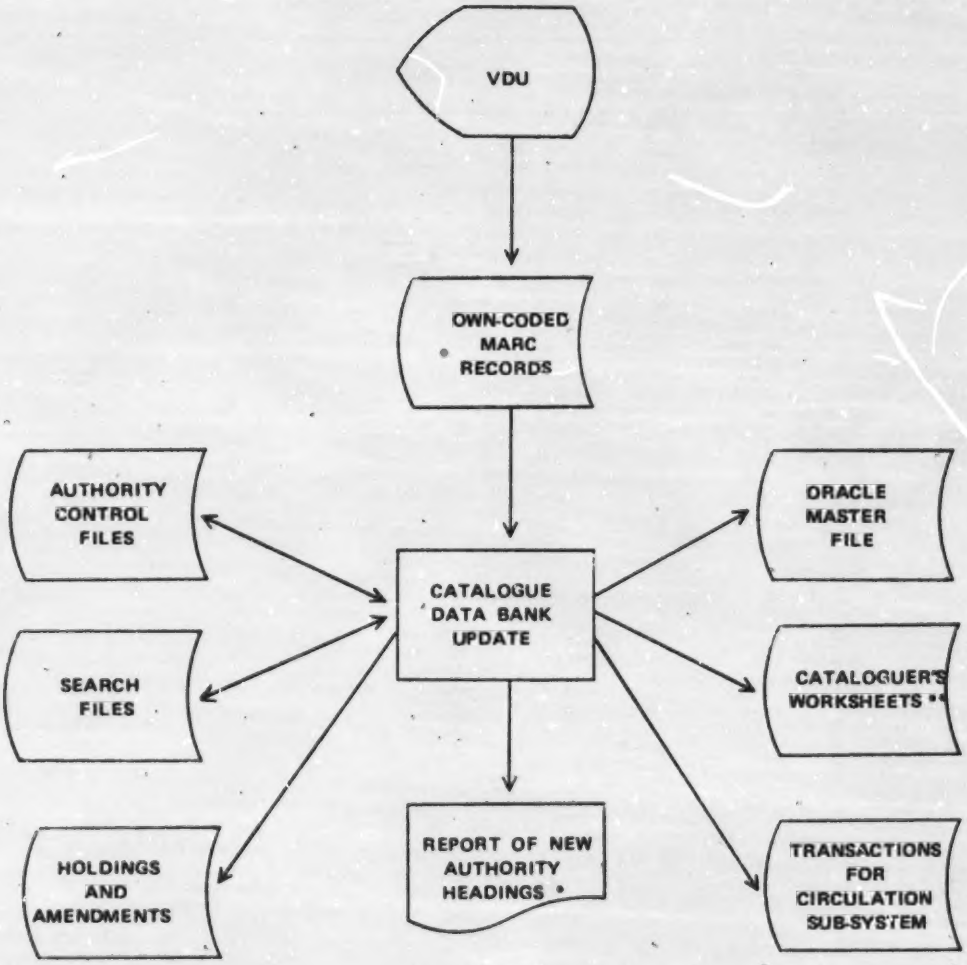

MARC RECORD TAPE RETURNED FROM AMRS
VALIDATION AND CONVERSION OF MARC RECORD TO INTERNAL FORMAT
ORACLE FORMATTED MARC RECORD
AUTHORITY CONTROL FILES
ORACLE MASTER FILE
SEARCH FILES
CATALOGUE DATA BANK UPDATE
STATUS OF MARC ORDERS
MARC RECORD RE-ORDERS
CATALOGUER'S WORKSHEETS **
REPORT OF NEW AUTHORITY HEADINGS *

* Report is routed to the Library User's Printer

** Worksheets are subsequently printed upon request by the Library User.

FIGURE 5.

PROCESSING OF OWN-CODED MARC RECORDS

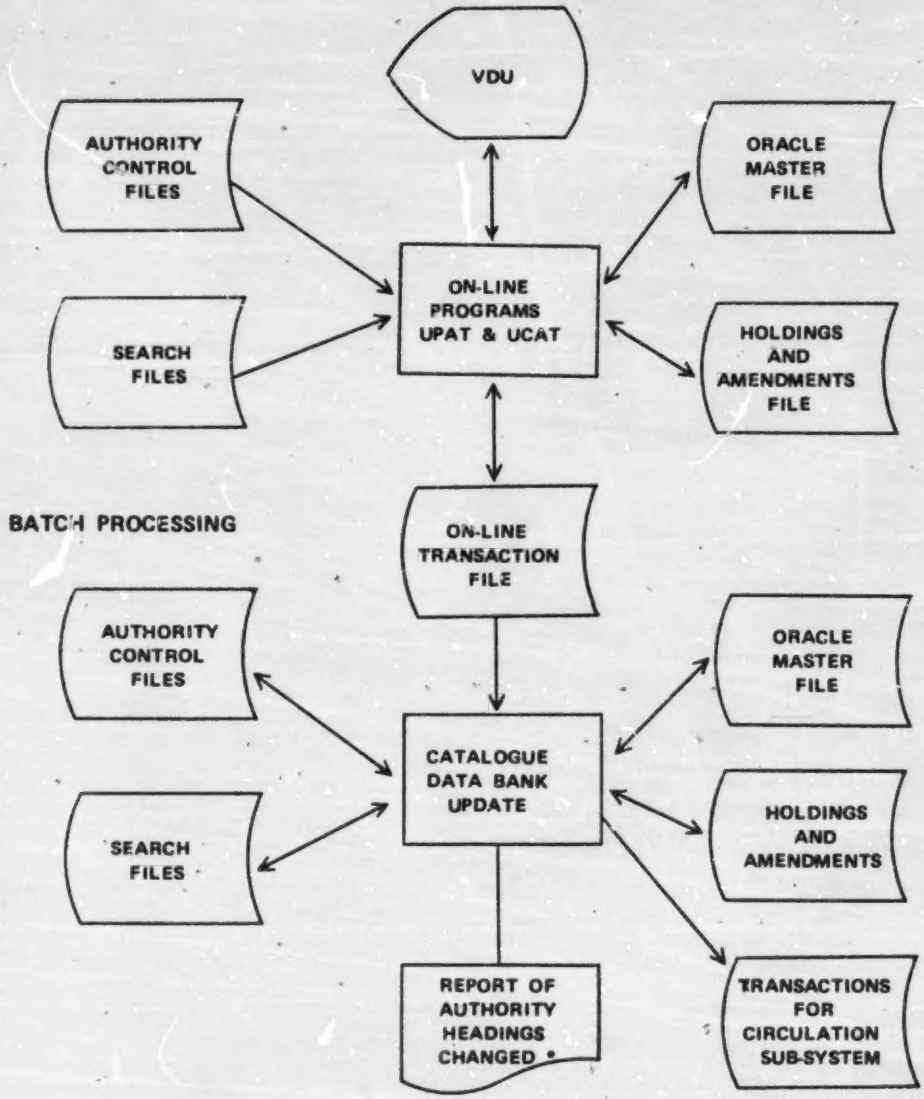


* Report is routed to Library User's Printer

** Worksheets are subsequently printed upon request by the Library User.

FIGURE 6.

PROCESSING ON-LINE CATALOGUE TRANSACTIONS



* Report is routed to Library User's Printer.

FIGURE 7.

COM CATALOGUE PRODUCTION

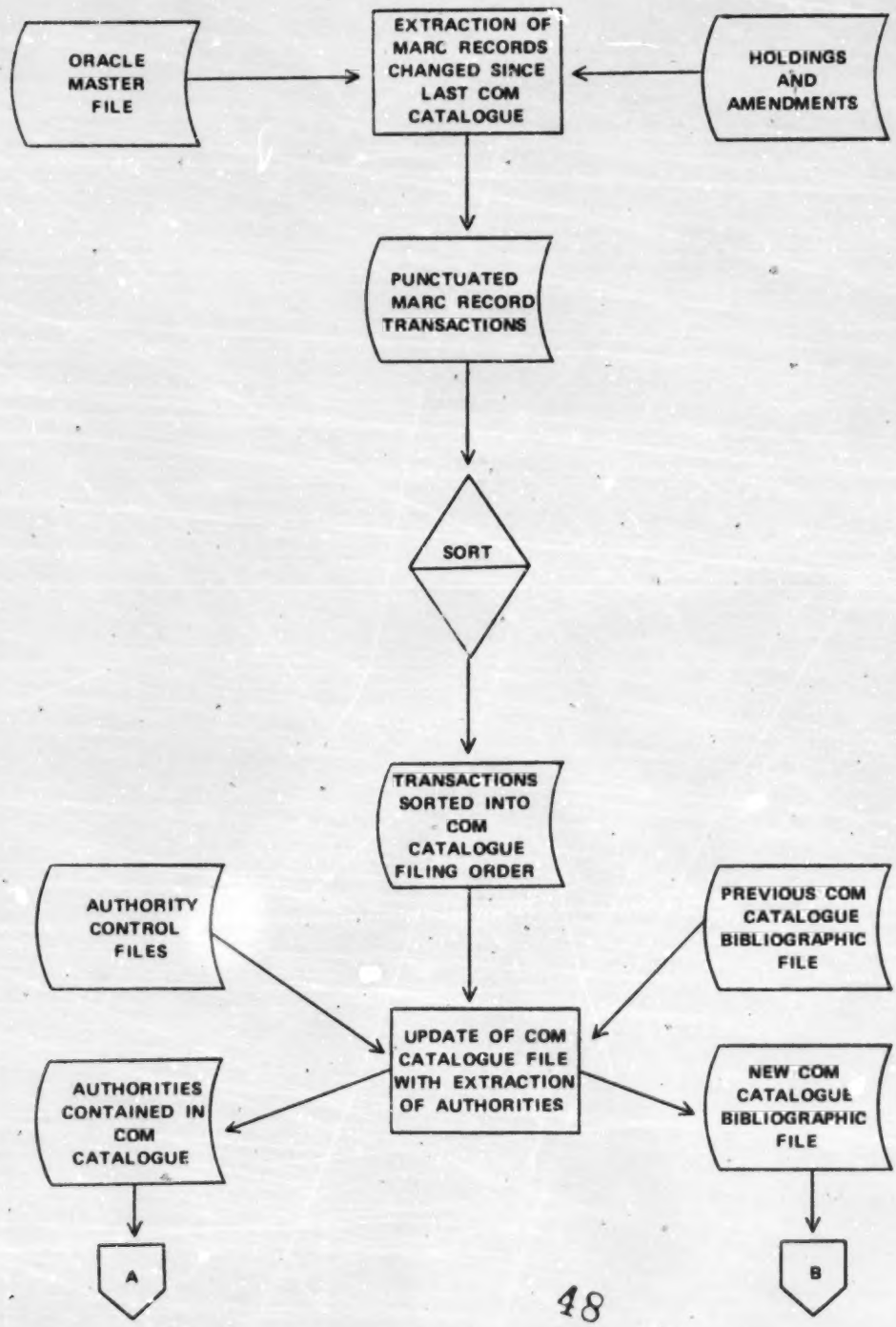
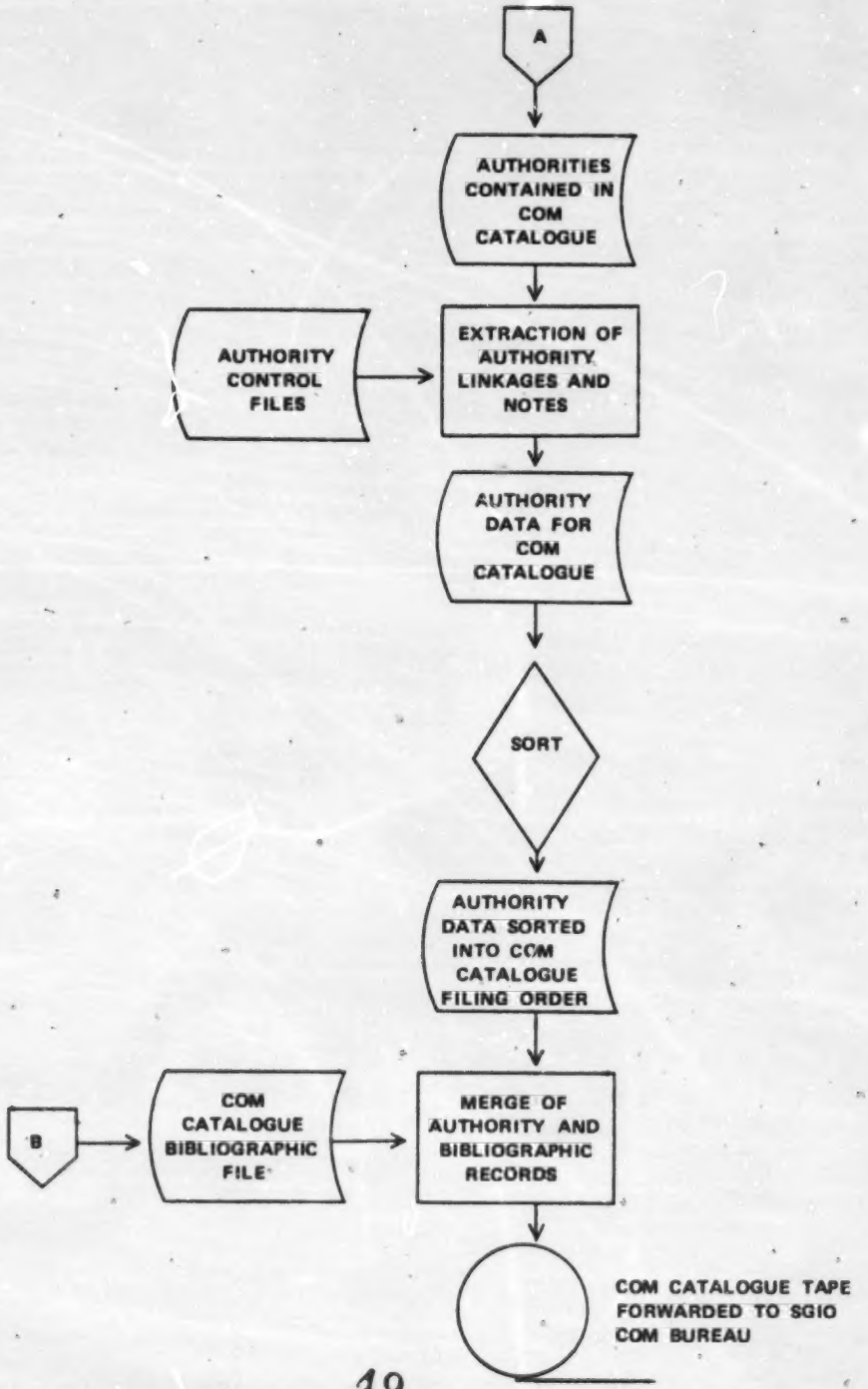

ORACLE MASTER FILE
EXTRACTION OF MARC RECORDS CHANGED SINCE LAST COM CATALOGUE
HOLDINGS AND AMENDMENTS
PUNCTUATED MARC RECORD TRANSACTIONS
SORT
TRANSACTIONS SORTED INTO COM CATALOGUE FILING ORDER
AUTHORITY CONTROL FILES
PREVIOUS COM CATALOGUE BIBLIOGRAPHIC FILE
UPDATE OF COM CATALOGUE FILE WITH EXTRACTION OF AUTHORITIES
AUTHORITIES CONTAINED IN COM CATALOGUE
NEW COM CATALOGUE BIBLIOGRAPHIC FILE
A
B

FIGURE 7.1

COM CATALOGUE PRODUCTION (CON'T.)


A
AUTHORITIES CONTAINED IN COM CATALOGUE
AUTHORITY CONTROL FILES
EXTRACTION OF AUTHORITY LINKAGES AND NOTES
AUTHORITY DATA FOR COM CATALOGUE
SORT
AUTHORITY DATA SORTED INTO COM CATALOGUE FILING ORDER
B
COM CATALOGUE BIBLIOGRAPHIC FILE
MERGE OF AUTHORITY AND BIBLIOGRAPHIC RECORDS
COM CATALOGUE TAPE FORWARDED TO SGIO COM BUREAU

PART 6

DEFINITIONS

Because the meanings of some terms used may be ambiguous, the following defintions are offered:

Batch operation — Data is collected and stored for a subsequent computer run.

Content Designators — Information in a machine-readable catalogue record that explicitly identifies the elements of contents of the record, e.g. tags, indicators, or sub-field codes. All references to specific content designators refer to the Australian MARC Specification, 2nd ed., 1975.

Cross-reference — A record that directs a user from a variant form of a heading to the authoritative form (a "see" reference) or from one authoritative form to another authoritative form because they are related (a "see-also" reference).

Established Heading — The authoritative form of a name, subject, uniform title, series, etc., that is used as an access point to a bibliographic record or authority record.

Higher-level Headings — Higher elements in the hierarchy, e.g. Education is a higher-level heading of Education – Periodicals.

On-line Operation — The terminal is in direct contact with the computer.

Real-time Operation — Relevant files are immediately up-dated by data input at an on-line terminal.

Tracings — Statements which indicate which cross-references should be made to the established heading: generally appear as "x" preceding a "see-from" reference of "xx" preceding a "see also from" reference (which, in a cross-reference record, become a "see" and "see also" reference, respectively).

Validation (AusMARC) — Verification that content designators comply with the relevant Australian MARC specification.